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09/925,077	08/08/2001	Everest W. Huang	TI-31514	3083

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EXAMINER


MEEK, JACOB M

ART UNIT	PAPER NUMBER
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2637

DATE MAILED: 03/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/925,077	Applicant(s)  HUANG ET AL.	
	Examiner Jacob Meek	Art Unit 2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 - 10, 13 - 26 is/are rejected.
- 7) ☒ Claim(s) 11, 12, 27 and 28 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicant's arguments (see pages 14 – 16), filed October 29, 2004, with respect to the rejection(s) of claim(s) 1 – 13, and 18 – 26 under 35 USC 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Wang and Poor, which was included as NPL reference in previous action.

Claim Objections

2. Claims 5, 11, 12 are objected to because of the following informalities: Claim 5 states that probabilities corresponding to communications symbols are received at a priori output probability terminals of SISO decoders, however review of the spec indicates that a priori outputs of probability generator is used to produce a priori inputs to decoders. Claims 11 and 12 recite the limitation of an input terminal being connected to an input terminal through one of a deinterleaver and an interleaver. Should this be or? Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 - 10, 13 – 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Wang et al (Iterative (turbo) soft interference cancellation and decoding for coded CDMA; Xiaodong Wang; Poor, H.V.; Communications, IEEE Transactions on , Volume: 47 , Issue: 7 , July 1999; Pages:1046 - 1061.).

With regard to Claim 1, Wang teaches a wireless communication receiving apparatus (see page 1048, section B) comprising an antenna (inherent) for receiving via 1st and 2nd wireless communication channels a composite communication symbol (see Figure 1, Receiver end) which correspond to results of 1st and 2nd coding operations performed by a transmitter on a bit stream and an interleaved version of the bitstream (see Figure 1, Transmitter end), respectively; a probability generator (see Figure 1, block SISO multiuser detector and page 1048, section B, 1st paragraph where SISO multiuser detector is interpreted as probability generator) coupled to antenna and responsive to composite communication for generating for each of 1st and 2nd communication symbols (Figure 1, signals $\Lambda_1 b_1(i)$ and $\Lambda_1 b_2(i)$), a corresponding plurality of probabilities that the communication symbol has respective ones of a plurality of possible values of the communication symbol (see page 1048, section b, 1st paragraph, 4th sentence); 1st and 2nd SISO decoders (Figure 1, blocks SISO Channel Decoders 1 and 2) corresponding to 1st and 2nd coding operations (see figure 1, symbol mappers) and coupled to probability generator for respectively receiving therefrom the probabilities corresponding to 1st and 2nd communication symbols (see page 1048, section B, 1st paragraph, 4th sentence where LLR is interpreted as a probability); and probability generator operable for generating at least one of pluralities of probabilities also in response to SISO information received by probability generator from at least one of said SISO decoders (See Figure 1, signals $\Lambda_1 b_1(i)$ and $\Lambda_1 b_2(i)$, $\lambda_2 b_1(i)$ and $\lambda_2 b_2(i)$ and page 1048, section B, 1st paragraph 6th sentence (below Eq.6)).

With regard to Claim 2, Wang teaches a probability generator operable for generating probabilities in response to SISO information received from a respective one of said SISO decoders (See Figure 1, signals $\Lambda_1 b_1(i)$ and $\Lambda_1 b_2(i)$, $\lambda_2 b_1(i)$ and $\lambda_2 b_2(i)$ and page 1048, section B, 1st paragraph 6th sentence (below Eq.6) where this is interpreted as equivalent functionality).

With regard to Claim 3, Wang teaches a probability generator operable for generating probabilities corresponding to first communication symbol in response to SISO information received from 2nd SISO decoder, and for generating probabilities corresponding to second communication symbol in response to SISO information received from 1st SISO decoder (See Figure 1, signals $\Lambda_1 b_1(i)$ and $\Lambda_1 b_2(i)$, $\lambda_2 b_1(i)$ and $\lambda_2 b_2(i)$ and page 1048, section B, 1st paragraph 6th sentence (below Eq.6) where this is interpreted as equivalent functionality).

With regard to Claim 4, Wang teaches SISO information from 2nd SISO decoder includes probabilities that 2nd communication symbol has respective ones of possible values of 2nd communication symbol, and SISO information from 1st SISO decoder includes probabilities that 1st communication symbol has possible values of 1st communication symbol (See page 1049, 2nd column, 1st and 2nd sentences).

With regard to Claim 5, Wang teaches that probabilities corresponding to 1st communication symbol are received at an a priori output (see 112, 2nd above) of 1st SISO decoder and probabilities corresponding to 2nd communication symbol are received at an a priori output (see 112, 2nd above) of 2nd SISO decoder (see page 1048, section III, 1st paragraph, 1st sentence).

With regard to claim 6, Wang teaches that further pluralities of probabilities are pluralities of a posteriori output probabilities (see page 1048, 1st column, last paragraph and Figure 1,

SISO channel decoder output and feedback path to SISO multiuser detector and summing element where this is interpreted as equivalent functionality).

With regard to claim 7, Wang teaches that further pluralities of probabilities are pluralities of a posteriori output probabilities (see page 1048, 1st column, last paragraph and Figure 1, SISO channel decoder output and feedback path to SISO multiuser detector and summing element where this is interpreted as equivalent functionality).

With regard to claim 8, Wang teaches that at least one of pluralities of probabilities corresponds to 1st communications symbol (see Figure 1, $\lambda_1 b_1(i)$) and at least one SISO decoder is 2nd SISO decoder (see figure 1, middle SISO channel decoder where this is interpreted as 2nd SISO decoder).

With regard to claim 9, Wang teaches that SISO information received from 2nd SISO decoder includes further probabilities of probabilities that 2nd communication symbol has respective ones of possible values of 2nd communication symbol ((See page 1049, 2nd column, 1st and 2nd sentences).

With regard to claim 10, Wang teaches that further pluralities of probabilities are pluralities of a posteriori output probabilities produced by 2nd SISO decoder(see page 1048, 1st column, last paragraph and Figure 1, SISO channel decoder output and feedback path to SISO multiuser detector and summing element where this is interpreted as equivalent functionality).

With regard to claim 13, Wang teaches an apparatus with an interleaver and a deinterleaver connected between one of SISO decoders and probability generator (see Figure 1, π_1 and π_1^{-1}).

With regard to claim 14, Wang teaches an apparatus with an interleaver and a deinterleaver connected between the other SISO decoder and probability generator (see Figure 1, π_2 and π_2^{-1}).

With regard to claim 15, Wang teaches an apparatus with an interleaver connected between one of SISO decoders and probability generator and a deinterleaver connected between one of SISO decoders and probability generator (see Figure 1, π_1 and π_1^{-1}).

With regard to claim 16, Wang teaches an apparatus with an interleaver connected between the other SISO decoder and probability generator and a deinterleaver connected between the other SISO decoder and probability generator (see Figure 1, π_2 and π_2^{-1}).

With regard to claim 17, Wang teaches an apparatus with de-interleavers coupled between probability generator and 1st and 2nd SISO decoders connected to a priori output terminal (see Figure 1, π_1^{-1} , π_2^{-1} and page 1048, section III, 1st paragraph, 1st sentence where this is interpreted as equivalent) and wherein interleavers (see Figure 1, π_1 and π_2) coupled between probability generator and 1st and 2nd SISO decoders are connected to a posteriori output terminals of SISO decoders (see page 1048, 1st column, last paragraph).

With regard to claims 18 – 26, the steps claimed as method is nothing more than a restating the function of the specific components of the apparatus as claimed above and therefore it would have been obvious, considering the aforementioned rejection for the apparatus claims 1 –6, 8 – 10 respectively.

Allowable Subject Matter

4. Claims 10, 11, 27, and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Other Cited Prior Art

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Raghavan (US Patent 6,038,269), and Glese et al (US Patent 6,598,204) teach the use of decoders with probability generators.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacob Meek whose telephone number is (571)272-3013. The examiner can normally be reached on 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571)272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JMM



JAY K. PATEL
SUPERVISORY PATENT EXAMINER